IN THE CLAIMS:

1. (Currently Amended) A projection electron lithography system, comprising:

a lithography tool for emitting a beam of electrons and producing measurement information; and

a processor including,

a plurality of different predictive models ~~at least one pre-existing model~~ for producing predictive information, and

an estimator for controlling placement of the beam of electrons based on said ~~the~~ predictive information ~~from said at least one pre-existing model~~ and said measurement information from said lithography tool, said estimator having a tunable strength parameter to determine an optimal adaptation weighting criterion.

2. (Original) The system of claim 1, wherein said estimator compensates for heating and beam drift effects.

3. (Original) The system of claim 1, wherein said estimator is a Kalman filter, using least-squares based linear matrix algebra.

4. (Original) The system of claim 1, wherein said system is a SCALPEL system.

5. (Currently Amended) The system of claim 1 ~~3~~, wherein said estimator ~~at least one pre-existing model includes a plurality of different pre-existing models and said Kalman filter~~ is an adaptive Kalman filter that ~~wherein said adaptive Kalman filter~~ iteratively selects one of said plurality of different pre-existing models until a best one of said plurality of different pre-existing models emerges.

6. (Currently Amended) The system of claim 1 ~~3~~, wherein said estimator is ~~at least~~

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~~one pre-existing model includes a plurality of different pre-existing models and said Kalman filter is~~ an adaptive Kalman filter <u>and each of said plurality of predictive models is partitioned into wafer scale components and die scale components,</u> said adaptive Kalman filter <u>only employed for wafer scale components</u> ~~having a tunable strength parameter to determine an optimal adaptation weighting criterion.~~

7.   (Currently Amended) The system of claim <u>1</u> ~~5~~, wherein said plurality of different predictive ~~pre-existing~~ models <u>differ due to a single parameter that varies in each of said plurality of different predictive</u> ~~includes three or more pre-existing~~ models.

8.   (Currently Amended) The system of claim <u>1</u> ~~6~~, wherein said plurality of different predictive ~~pre-existing~~ models includes three or more models.

9.   (Currently Amended) A process for controlling projection electron lithography, comprising:

emitting a beam of electrons;

producing measurement information on said emitting step;

producing predictive information related to the projection electron lithography process based on <u>a plurality of different predictive models;</u> ~~at least one pre-existing model, and~~

<u>selecting one of said plurality of different predictive models until a best one of said plurality of different predictive models emerges; and</u>

controlling placement of the beam of electrons based on <u>selected</u> ~~the~~ predictive information <u>from said best one</u> and the measurement information.

10.   (Original) The process of claim 9, wherein said controlling step is implemented as a Kalman filter using least-squares based linear matrix algebra.

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11.   (Original) The process of claim 9, wherein said controlling step compensates for heating and beam drift effects.

12.   (Original) The process of claim 9, wherein said process is a SCALPEL process.

13,   (Currently Amended) The process of claim 9, wherein said controlling step is implemented as an adaptive Kalman filter and each of said plurality of predictive models is partitioned into wafer scale components and die scale components, said adaptive Kalman filter only employed for wafer scale components the predictive information is produced by a plurality of different pre-existing models, wherein said controlling step iteratively selects one of said plurality of different models until a best one of said plurality of different models emerges.

14.   (Currently Amended) The process of claim 9, wherein the predictive information is produced by a plurality of different pre-existing models, wherein said controlling step has a tunable strength parameter to determine an optimal adaptation weighting criterion.

15.   (Currently Amended) The process of claim 9 13 wherein said selecting is performed iteratively the plurality of different models includes three or more models.

16.   (Currently Amended) The process of claim 9 14, wherein said the plurality of different predictive models differ due to a single parameter that varies in each of said plurality of different predictive includes three or more models.

17.   (Currently Amended) A projection electron lithography system, comprising:

.   a lithography tool for emitting a beam of electrons and producing measurement information; and

a processor including,

a plurality of different predictive pre-existing models for producing predictive

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information, and

an adaptive estimator that iteratively selects a best one of said plurality of

predictive ~~pre-existing~~ models and controls placement of said beam of electrons based on said

predictive information from said best one and measurement information from said lithography

tool.

18.   (Currently Amended) The system of claim 17 wherein said plurality of different

predictive ~~pre-existing~~ models are only directed to producing said predictive information for

corrections associated with a die scale.

19.   (Previously Presented) The system of claim 17 wherein said adaptive estimator

employs a tunable strength parameter to determine an optimal adaptation weighting criterion of

said predictive information and said measurement information.

20.   (Previously Presented) The system of claim 17 wherein said system is a

SCALPEL system and said adaptive estimator is an adaptive Kalman filter.

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